

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS									
ABE	REVIATIONS &	бүмво	LS						
АН	Arch Head Height	ER	Earth Rod	RSD	Roller Shutter Door				
A/B	Air Brick	ET	EP+Transformer	RSJ	Rolled Steel Joist				
AR	Assumed Route	FB	Flower Bed	SI	Sign Post				
AV	Air Valve	FBD	Floor Board Direction	SP	Arch Spring Point Heigh				
BB	Belisha Beacon	FH	Fire Hydrant	sv	Stop Valve				
BH	Bore Hole	FL	Floor Level	SW	Surface Water				
BL	Bed Level	FP	Flag Pole	SY	Cable Stay				
во	Bollard	FW	Foul Water	Тас	Tactile Paving				
BrP	Brace Post	GG	Gully Grate	тс	Telecom Cover				
BS	Bus Stop	GV	Gas Valve	тн	Trial Pit				

APPENDIX C EXISITING CONTOUR PLAN

Barratt David Wilson Homes & Hopkins Homes Humber Doucy Lane Flood Risk Assessment & Drainage Strategy 681058-R1(0)-FRA

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APPENDIX D ANGLIAN WATER RECORDS

Barratt David Wilson Homes & Hopkins Homes Humber Doucy Lane Flood Risk Assessment & Drainage Strategy 681058-R1(0)-FRA

This plan is provided by Anglian Water pursuant its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2021 Ordnance Survey 100022432. This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.

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Our Ref: 743547 - 3

Clean Water Plan A3

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2402	618252	246406	C	-	-	-
2403 2501	618235 618254	246439 246564	C C	-	-	-
2601	618213	246627	C C	-	-	-
3601	618337	246696	C	-	-	-
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3701 3702	618373 618339	246710 246749	C C	-	-	-
4301	618462	246360	C	46.934	45.374	1.56
4302 4304	618453 618488	246359 246361	C C	46.955 46.943	45.795 44.383	1.16 2.56
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1302	618165	246377	F	-	-	-
2602	618291	246633	F	-	-	-
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Wastewater Plan A3

Our Ref: 743547 - 4

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APPENDIX E FRAMEWORK PLAN

Barratt David Wilson Homes & Hopkins Homes Humber Doucy Lane Flood Risk Assessment & Drainage Strategy 681058-R1(0)-FRA

CDM REGULATIONS 2015 All current drawings and specifications for the project must be read in conjunction with the Designer's Hazard and Environment Assessment Record. All intellectual property rights reserved

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Designed with reference to the surveys, information and reports listed: OSMap and Topographic Survey received from the client

OI 06/02/2024 Scale @ A1 1:2500

KEYS

- site boundary
 - borough boundary
 - opportunity for a mixed-use development

NOTE: Secondary and tertiary roads are intended for illustartive purposes and will be established further at the RMA stage

HUMBER DOUCY LANE

HDL-PRP-XX-XX-DR-A-07207 **REV P01** S0

APPENDIX F ADDITIONAL GEOTECHNICAL INVESTIGATION

Barratt David Wilson Homes & Hopkins Homes Humber Doucy Lane Flood Risk Assessment & Drainage Strategy 681058-R1(0)-FRA

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		6.00	D			5.80			Loose c some fir pockets and rare (Lowest Medium very sar GRAVE	prange brown ne-coarse ang of soft orange e coarse grave toft Formation n dense orang ndy fine-coars L with occasic t chalk gravel	medium-coa jular-rounde e brown and el size flint g - Albion Gla e brown and e angular-re onal fine-me	arse SAND ed flint grave I grey silty o gravel concre acigenic Gro d white rinde bunded flint dium angula	with el, lay etions oup) ed ar-	6
		7.00	D			7.50		×	(Lowest	toft Formation	- Albion Gla	acigenic Gro	oup)	7 —
		8.00	D			8.00			SAND v flint grav (Lowest	vith a little fine vel toft Formation End of E	- Medium ai - Albion Gla Borehole at 8	acigenic Gro	ded	8
Depth 8.0	Hole Diam Base [0	eter Diameter 200	Casing Depth Base 8.00	Diameter Diameter 200	Depth Top 0.00	Depth Base 1.20	Chiselling se Dura 01:	ation 00 Hand	Tool l excavated	Depth Top	Inclination Depth Base	and Orientation Inclination	Orient	10
Rema No gro cappe	arks oundwater d and pro	r encounte tected with	red. 50mm o raised lock	diameter pipe able cover. So	installed to bakage test	8.00m. 25n t at 8.00m (7	nm diame 75 mins)	eter piezom	eter pipe i	nstalled to 8.0	0m. Pipewo	ork	AGS	3

RSA (Oveck	NICS LTD			Ρ	ercu	issi	on [Drill	ing L	_og			
Projec Lane	ct Name	: Land Nor	rth of Hum	ber Doucy	Client:	Barratt Hor	nes Easte	ern Counti	es	Date: 05/0	2/2024 - 0	6/02/2024		
Locat	ion: Ipsv	vich, Suffo	lk		Contrac	tor: Boreh	ole Servio	ces		Co-ords: E	618668.00) N246839.0	0	
Proje	ct No. : 1	6118GI			Crew N	ame: NI				Drilling Eq	uipment: D	ando 2000		
Boi	ehole N BHSA	umber)3	Hole (e Type ℃P		Level		Logged JMK	Ву	So 1	cale :50	Page She	• Numbe et 1 of 1	er 1
Well	Water Strikes	Sam	nple and li	n Situ Testii Resul	ng te	Depth (m)	Level (m)	Legend		Stratum Description				
	Strikes Water Added =550 I	Depth (n 0.50 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00	n) Type D D D D D D D D D D D D D D D	Resul	ts	(m) 5.40 7.50 8.00	(m)		Firm-sti sandy s subang rare por (Lowes)	Stratu ff orange bro illty CLAY wit ular fine-coal ckets of oran toft Formation ing stiff and mately brown slight ular fine-coal toft Formation brown slight ular fine-coal toft Formation End of	um Descrip win and light h a little sub rse chalk an ge brown sii n - Albion G d darker in d darker in d darker in us silty sand rse chalk an n - Albion G bris n - Albion G Borehole at a	t grey slightly prounded- d flint gravel a t lacigenic Grou <i>colour from</i> y subrounded d flint GRAVE lacigenic Grou SAND with lacigenic Grou 8.00m	and 	
Depth	Hole Diam Base [eter Diameter	Casing Depth Base	Diameter Diameter	Depth	Depth B	Chiselling ase Dura	ation	Tool	Depth Top	Inclination	and Orientation	Orient	9
8.0	0	200	8.00	200	0.00	1.20	01:	00 Hand	d excavated	,				
Rema No gro	arks	r encounter	ed. 50mm d	liameter HDP	E pipe ins	stalled to 8.0	00m. 19mn	n diameter p	piezomete	r pipe installe	ed to 8.00m.			
Pipew	ork cappe	ed and prote	ected with fl	ush lockable o	cover. So	akage test a	it 8.00m (7	5 mins)					AGS	

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RSA () E OTECH	NICS LTD			Ρ	ercı	ıssi	on [Drill	ing Lo	og			
Proje	ct Name	: Land No	orth of Hum	ber Doucy	Client: E	Barratt Hor	nes East	ern Counti	es	Date: 06/02/2	2024			
Locat	ion: Ipsv	vich, Suffe	olk		Contrac	tor: Boreh	ole Servi	ces		Co-ords: E61	8847.00	N246783.0	00	
Proje	ct No. : ´	16118GI			Crew Na	ame: NI				Drilling Equip	oment: Da	ndo 2000		
Во	rehole N BHSA	lumber 04	Hole (e Type CP		Level		Logged JMK	Ву	Scal 1:50	le)	Page She	Number et 1 of 1	
Well	Water	Sar	mple and l	n Situ Testi	ng	Depth	Level	Legend		Stratum	n Descript	ion		
	Strikes Water Added =4001	Depth (0.50 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00	n) Type D	Resu	Its	6.00 8.00			Very so with a li chalk a (Lowes orange (Lowes Orange subang (Lowes	Stratum ft orange brown ange brown and vith a little subro chalk and flint g brown silt toft Formation - • • • • • • • • • • • • •	silty sandy challen at 8.	ion ndy silty CL ar fine-coars cigenic Gro tly sandy sil angular fine are pockets cigenic Gro subroundec flint GRAVE cigenic Gro	AY se up) ty s- of up)	1
Depth 8.0	Hole Diam Base I 00	eter Diameter 200	Casing Depth Base 8.00	Diameter Diameter 200	Depth Tc 0.00	p Depth Ba	Chiselling ase Dura 01:	ation Han	Tool d excavated	Depth Top D	Inclination a epth Base	nd Orientation	Orientatio	
Rem No gro Pipew	arks oundwate ork cappe	r encounte ed and pro	red. 50mm c tected with fl	liameter HDP ush lockable	E pipe ins cover. Soa	talled to 8.0 akage test a	00m. 19mn t 8.00m (7	n diameter 5 mins)	piezomete	er pipe installed	to 8.00m.		AGS	

	\land	
RSA	GEOTECHNICS	LTD

Percussion Drilling Log

i i ojoot i tuint	5. Lanu Nu	orth of Hum	ber Doucy						D-t 00/44/0000 0/	0/44/0000	
Lane	wish Ouffe			Client: E				es	Date: 28/11/2023 - 30	0/11/2023	
Location: Ips		ык		Contrac	tor: Borenc	ble Servi	ces			J N246644.00	
Borehole 1	Jumber	Hole	Type	Crew N			Logged	By	Scale	Page Nu	mher
BHSA	.05	(CP		Level		JMK	Бу	1:50	Sheet 1	of 3
Well Water	Sar	nple and l	n Situ Testii	ng	Depth	Level	Legend		Stratum Descrir	otion	
Strikes	Depth (m) Type	Resul	ts	(m)	(m)	g	Cultivat	ed Topsoil (Driller's Desc	vrintion	
Added =1450 I	0.50	D			0.20		1	Soft ora CLAY w chalk gr subang (Lowest	ange brown and brown sl ith occasional subround ravel, pockets of dark gre ular-angular fine-coarse toft Formation - Albion G	ightly sandy silty ed fine-coarse ey silt and very rare flint gravel lacigenic Group)	e 1 -
	2.00	D					(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)				2 -
	3.00	D						- becom	ing stiff with depth		3 -
	4.00	D									4
	5.00	D			5.40			Orange	brown clayey silty fine-c	coarse SAND with	5 - a
	6.00	D			0.50			little sub (Lowest	brounded fine-medium cł toft Formation - Albion G	halk gravel lacigenic Group)	6
	7.00	D			6.50			Orange occasio chalk ar (Lowest	brown silty fine-coarse S nal subrounded-subangu nd fiint gravel toft Formation - Albion G	SAND with ular fine-coarse lacigenic Group)	7 -
	8.00	D			8.00			Orange subrour quartzit (Lowest	brown slightly silty fine-c nded-subangular fine-coa e GRAVEL toft Formation - Albion G	coarse SAND and arse flint and lacigenic Group)	8 -
	9.00	D									9 -
×18	10.00	D									10 -
Hole Dian	neter	Casing	Diameter			Chiselling			Inclination	and Orientation	
Depth Base 10.50 27.60 Remarks	Diameter 200 150	Depth Base 10.50 27.60	Diameter 200 150	Depth To	Depth Ba	ase Dura 01	ation Hand	Tool d excavated	Depth Top Depth Base	Inclination Or	ientation

RSA G	otech	NICS LTD			P	ercu	ISS	sio	n E	Drill	ing L	_og			
Projec	t Name:	: Land Nor	rth of Hum	ber Doucy	Client: Ba	arratt Hom	nes E	astern	Countie	es	Date: 28/1	1/2023 - 30)/11/2023		
Locati	on: Ipsw	/ich, Suffo	lk		Contract	or: Boreho	le Se	ervices			Co-ords: E	618674.00	N246644	4.00	
Projec	t No. : 1	6118GI			Crew Na	me: NI					Drilling Eq	uipment: D	ando 200	0	
Bor	ehole N	umber	Hole	е Туре		Level		L	ogged	Ву	S	cale	Pa	ge Numb	er
	Water	^{/5} Sarr	nple and li	n Situ Testin	a	Depth	Lev	el	JIVIK			.50	31		<u> </u>
Well	Strikes	Depth (r	n) Type	Result	s	(m)	(m	i) Le	gend		Strat	um Descrip	tion		
		11.00	D							Orange subrour quartzit (Lowest	brown slight Ided-subang e GRAVEL ioft Formatio	ly silty fine-co ular fine-coa n - Albion Gl	oarse SAN rse flint an acigenic G	ID and d roup)	
		12.00	D												12
		13.00	D												13
		14.00 15.00	D												14
		16.00	D												16
		17.00	D												17
		18.00	D												18
		19.00 20.00	D			20.00									19
	Hole Diame	eter	Casing	Diameter			Chisel	lling			_	Inclination	and Orientati	on	
Depth E 10.5 27.6 Rema	Base [])iameter 200 150	Depth Base 10.50 27.60	Diameter 200 150	Depth Top 0.00	Depth Ba	se	Duration 01:00	Hand	Tool excavated	Depth Top	Depth Base	Inclination	Orient	tation

AGS

lockable cover.

RSA G	E OTECK	NICS LTD			F	Percu	JSS	ion	D	rilli	ing	Log			
Projeo Lane	ct Name	: Land Nort	th of Hum	ber Doucy	Client	: Barratt Hon	nes Eas	tern Co	unties		Date: 28	/11/2023 - 3	0/11/2023	3	
Locat	on: Ipsv	vich, Suffoll	k		Contr	actor: Boreho	ole Serv	ces			Co-ords:	E618674.0) N24664	4.00	
Projec	ct No. : 1	6118GI			Crew	Name: NI					Drilling E	quipment: D	ando 200	00	
Bor	ehole N	umber	Hole	e Type		Level		Logo	jed By	/		Scale	Pa	age Numb	er 3
14/-11	Water	Sam	ple and li	n Situ Testin	g	Depth	Level				0.	1.00			Ĭ
vveii	Strikes	Depth (m	n) Type	Result	S	(m)	(m)	Lege	na		Stra	atum Descri			
		21.00 22.00	D						× C C C C C C C C C C C C C C C C C C C	Drange occasion clay and lint and Lowest	brown silty nal seams I rare subr quartzite (oft Format	/ fine-coarse 3 of soft grey b ounded-subar gravel ion - Albion G	SAND with rown silty s ngular fine lacigenic C	sandy -coarse Group)	21
		23.00	D						× × × × × ×						23
		24.00	D			24.00			× [× v × (×	Dark ora with occ Red Cr	ange brow asional fin ag Format	n slightly silty e gravel size ion - Crag Gro	fine-coars shell fragn oup)	e SAND nents	- 24
		25.00	D						× × × ×						25 -
		26.00	D						× × ×						26 -
		26.50	W					× × × × × ×	× × ×						
· · · · · · · · · · · · · · · · · · ·		27.60	D			27.40 27.60		× · · · · · · · · · · · · · · · · · · ·	× × × × ×	Stiff extr	emely clos	sely fissured g s and partings	grey silty C s of light gr	LAY with ey silt	
										London	<u>i Clay Forr</u> End c	nation - Tham f Borehole at 2	les Group) 27.60m		28 -
															29 -
															30 —
Depth	Hole Diam Base [eter Diameter [Casing Depth Base	Diameter Diameter	Depth	Top Depth Ba	Chiselling ase Dur	ation	То	ol	Depth Top	Inclination Depth Base	and Orienta	tion n Orien	tation
10.5 27.6	80	200 150	10.50 27.60	200 150	0.0	JU 1.20	0.	1.00	riand exc	cavated					
Rema Ground lockab	arks dwater st le cover	ruck at 21.60	0m. 25mm	diameter piezo	ometer	pipe installed	to 27.00r	n. Pipew	ork ca	pped ar	nd protecte	ed with raised			

AGS

Proie	ct Name	· Land North	of Hum	her Doucy	• •							
Lane			OFFICIEN		Client: Ba	arratt Hon	nes East	ern Counti	es	Date: 07/02/2024 - 0	9/02/2024	
Locat	ion: Ipsv	vich, Suffolk			Contracto	or: Boreho	ole Servi	ces		Co-ords: E618925.0	0 N246401.0	00
Proje	ct No. : 1	6118GI	Holo	Type	Crew Na	me: NI		Loggod	By	Drilling Equipment: [Dando 2000	Number
Ы	BHSA	06	C	'iype P		Level		JMK	Бу	1:50	She	et 1 of 1
Well	Water	Sampl	le and Ir	n Situ Testir	ng	Depth	Level	Legend		Stratum Descri	ption	
	Water	Depth (m)	Туре	Resul	ts	(11)	(11)		Topsoil	(Soft dark brown silty sa	ndy clay with	rare
	Added =450	0.50 1.00 2.00	D			0.60		1 % 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1%	Firm ora Firm ora flittle sub flint grav (Lowest	n orange brown slightly sandy silty CLAY with a subrounded-subangular fine-coarse chalk and gravel and rare pockets of orange brown silt westoft Formation - Albion Glacigenic Group)		
		3.00 4.00 5.00	3.00 D 4.00 D 5.00 D 6.00 D						lacigenic Gro	3 - up) 4 - 5 -		
		6.00 D 7.00 D				6.10			Orange subang (Lowest	brown slightly silty sand ular fine-coarse chalk ar toft Formation - Albion G	ly subrounded Id flint GRAVE lacigenic Gro	
		8.00	D			8.00				End of Borehole at	8.00m	9 -
Depth 8.0 Rem No gro	Hole Diam Base [] 00 arks pundwate	eter Diameter De 200 r encountered	Casing I pth Base 8.00	Diameter Diameter 200 iameter HDPP	Depth Top 0.00	Depth Ba	Chiselling ase Dur 01	ation Hand	Tool d excavated	r pipe installed to 8.00m	n and Orientation Inclination	Orientation

RSA	GEOTECK	NICS LTD			P	ercu	issi	on [Drill	ing Log		
Proj	ect Name	: Land Nor	th of Hum	ber Doucy	Client: B	arratt Hon	nes Easte	ern Count	ies	Date: 27/11/2023		
Loca	; ition: Ipsv	vich, Suffol	k		Contract	or: Boreho	ole Servi	ces		Co-ords: E619125.00) N246438.0	00
Proj	ect No. : ²	16118GI			Crew Na	me: NI				Drilling Equipment: D	ando 2000	
B	orehole N	umber	Hole	Туре		Level		Logged	Ву	Scale	Page	e Number
	Water	Sam	ple and li) P n Situ Testii	na	Depth	Level	JIVIN		1.50	She	
Wel	Strikes	Depth (n	n) Type	Resul	ts	(m)	(m)	Legend		Stratum Descrip	otion	
	Water Added =7001	Depth (n 0.50 1.00 2.00 3.00 4.00 5.00 6.00	n) Type D D D D D D D	Resul	ts	(III) 0.10 1.50 5.80			Sandy 1 Soft ora subrour occasio (Lowest Soft-firm sandy s subang rare poo (Lowest (Lowest and flint (Lowest	Topsoil [Driller's Descripti Inge brown silty sandy C Inded-subangular fine-coa nal pockets of black silt toft Formation - Albion G n orange brown and light ilty CLAY with a little sub ular fine-coarse chalk an ckets of dark grey silt toft Formation - Albion G brown slightly silty fine-c ubrounded-subangular fit t gravel toft Formation - Albion G	on] LAY with a littl arse flint grave lacigenic Gro grey slightly rounded- d flint gravel a lacigenic Gro	tle - el and - up) 1 - and 2 - and 2 - up) - - and 2 - and 2 - up) - - and 2 - with 6 - up) - - with 6 - up) - -
·	Hole Diam h Base 1	8.00 8.00 Diameter 1 200	D D Casing Depth Base 8.00	Diameter Diameter 200	Depth Top 0.00	8.00	Chiselling Ise Dura	ation 00 Han	Tool	End of Borehole at Inclination	8.00m and Orientation Inclination	9 - 10 - Orientation
Ren No g capp	narks roundwate ed and pro	r encountere	ed. 50mm d raised locka	iameter pipe able cover. Sc	installed to bakage tes	8.00m. 25 t at 8.00m (mm diame 75 mins)	eter piezom	eter pipe i	nstalled to 8.00m. Pipew	ork	AGS

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GROUNDWATER MONITORING RECORD SHEET

Monitored	Aonitored depths to groundwater											
Location	Depth to g	roundwate	r (mbgl)									
	BHSA01	BHSA02	BHSA03	BHSA04	BHSA05	BHSA06	BHSA07	WS4	WS5	BH1	BH2	BH3
Depth of	8.00	8.00	8.00	8.00	27.00	8.00	8.00	4.00	4.00	3.50	3.50	3.50
Well (m)												
Date												
30-09-22								DRY	2.70	DRY	DRY	DRY
11-10-22								DRY	2.76	DRY	DRY	DRY
17-10-22			NC	T DRILLED (ND)			DRY	2.78	DRY	DRY	DRY
20-10-22								DRY	2.43	DRY	DRY	DRY
24-10-22								DRY	2.46	DRY	DRY	DRY
28-10-22								DRY	2.86	DRY	DRY	DRY
15-12-23	(ND)	(NM)	(ND)	(ND)	22.87	(ND)	(NM)		NOT	MONITORE) (NM)	
09-01-24	(ND)	7.87	(ND)	(ND)	22.86	(ND)	7.80	1.16	1.01	2.95	2.93	DRY
19-01-24	(ND)	7.84	(ND)	(ND)	22.84	(ND)	7.78	2.70	1.04	2.95	2.94	DRY
24-01-24	(ND)	7.85	(ND)	(ND)	22.84	(ND)	7.78	2.72	1.03	2.95	2.94	DRY
09-02-24	7.46	7.83	6.42	7.45	22.29	(ND)	7.85	0.21	0.55	3.58	3.62	DRY
22-02-24	7.71	7.82	7.28	7.37	22.84	7.26	7.78	2.69	1.01	2.95	2.93	DRY

RSA GEOTECHNICS LTD

Job No

Date

16118GI

FEBRUARY 2024

Borehole Number BHSA01, Tes	st 1, 8.00m	Ŗ
Borehole Diameter	B := 200mm	À
Borehole Depth	D := 8.00m	<u>Ω</u>
Depth from ground level to base of casing	$D_{c} := 7.50m$	
Depth from ground level to top of test interval	$D_S \coloneqq 0.07m$	Ē
Completion depth of test	$D_e := 0.65m$	
Pipe diameter	$B_p := 200 \text{mm}$	SC SC
Porosity	n := 100% no gravel used	G
Water Levels (mbGL) 0 0.07 0.5 0.09 1 0.11 1.5 0.14 2 0.15 3 0.17 4 0.2 5 0.21 7 0.24 9 0.27 12 0.31 15 0.34 20 0.38 25 0.4 30 0.43 40 0.51 50 0.58 60 0.65		
litter		

Test carried out by NI Date of test 05/02/24 R\16118GI Humber Doucy Lane, Ipswich, Suffolk, GJB\Calculations and File Notes\ Page 2 of 2 BHSA01 - Test 1.xmcd

Borehole Number BHSA02, Test 1, 8.00m Borehole Diameter B = 200mm Borehole Depth D = 8.00m Depth from ground level to base D _c = 7.50m Depth from ground level to top D _x = 3.60m of test interval D _k = 6.99m Pipe diameter B _p = 200mm Porosity n = 100% no gravel used Valer (mins) Valer (mbGL) Valer (mins) $\frac{3.6}{0.65 3.32}$ 13 5.01 13			
Borehole Diameter B = 200mm Borehole Depth D = 8.00m Depth from ground level to base of casing D _c := 7.50m Depth from ground level to top of test interval D _s := 3.60m Completion depth of test D _e := 6.99m Pipe diameter B _p := 200mm Porosity n := 100% no gravel used Vater (mins) Vater (mbGL) $\frac{0}{0}$ $\frac{3.82}{15}$ $\frac{1}{2}$ $\frac{4.83}{15}$ $\frac{2}{2}$ $\frac{6.83}{12}$ $\frac{1}{12}$ $\frac{6.83}{12}$ $\frac{1}{3}$ $\frac{6.83}{32}$ $\frac{1}{3}$ $\frac{6.81}{32}$ $\frac{1}{3}$ $\frac{6.81}{32}$ $\frac{1}{3}$ $\frac{6.81}{32}$ $\frac{1}{3}$ $\frac{6.81}{32}$ $\frac{1}{4}$ $\frac{6.81}{32}$ $\frac{1}{3}$	Borehole Number BHSA02, Test	1, 8.00m	R
Borehole Depth D := 8.00m Depth from ground level to base of casing of test interval $D_c := 7.50m$ Depth form ground level to top of test interval $D_c := 6.99m$ Completion depth of test $D_c := 6.99m$ Pipe diameter $B_p := 200mm$ Porosity $n := 100\%$ no gravel used Time Levels (model) $\frac{1}{16} \frac{3.362}{4.63}$ $\frac{1}{2} \frac{4.63}{4.63}$ $\frac{1}{2} \frac{4.63}{4.63}$ $\frac{1}{2} \frac{6.63}{4.63}$ $\frac{1}{2} \frac{6.63}{6.63}$	Borehole Diameter	B := 200mm	Ä
Depth from ground level to base of casing D _c := 7.50n Depth from ground level to top of test interval D _s := 3.60n Completion depth of test D _c := 6.99n Pipe diameter B _p := 200mm Porosity n := 100% no gravel used Image: market (mins) $\frac{0}{15}$ $\frac{0}{15}$ $\frac{38}{15}$ $\frac{15}{15}$ $\frac{451}{22}$ $\frac{15}{15}$ $\frac{451}{22}$ $\frac{15}{20}$ $\frac{641}{527}$ $\frac{2}{20}$ $\frac{641}{527}$ $\frac{2}{20}$ $\frac{641}{5631}$ $\frac{2}{20}$ $\frac{641}{5631}$ $\frac{2}{20}$ $\frac{641}{5631}$ $\frac{2}{20}$ $\frac{641}{5631}$ $\frac{2}{20}$ $\frac{641}{5631}$ $\frac{2}{20}$ $\frac{641}{6681}$ $\frac{12}{20}$ $\frac{641}{6681}$ $\frac{3}{20}$ $\frac{640}{688}$ $\frac{10}{68}$ $\frac{668}{689}$ $\frac{10}{68}$ $\frac{10}{688}$	Borehole Depth	D := 8.00m	Ω
Depth from ground level to top of test interval D _s := 3.60m Completion depth of test D _c := 6.99m Pipe diameter B _p := 200mm Porosity n := 100% no gravel used Image: the level's (mins) Used is 1000% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL) Image: the level's is 100% (mbGL)	Depth from ground level to base of casing	$D_{c} := 7.50m$	
Completion depth of test $D_c := 6.99n$ $B_p := 200mm$ Pipe diameter $B_p := 200mm$ G Porosity $n := 100\%$ no gravel used G $\frac{0}{15}$ $\frac{3.6}{15}$ $\frac{3.6}{15}$ $\frac{1}{15}$ $\frac{4.51}{4.51}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{6.51}{6.51}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{6.51}{6.51}$ $\frac{6.68}{6.56}$ $\frac{30}{6.68}$ $\frac{6.68}{6.98}$ $\frac{6.68}{6.98}$	Depth from ground level to top of test interval	D _s := 3.60m	Ē
Pipe diameter Bp := 200mm Porosity n := 100% no gravel used Image: Construction of the state of t	Completion depth of test	D _e := 6.99m	
Porosity n := 100% no gravel used Image: Time (mbGL) 0 3.60 0 3.80 3.80 1 4.32 4.83 1 4.32 4.83 2 4.63 3.60 3 3.50 4.51 2 4.63 3.60 3 3.53 3.53 9 5.61 3.00 4 5.19 5.51 2.0 6.41 2.2 2.0 6.41 2.5 2.0 6.41 2.5 3.0 6.88 6.50 6.50 6.56 6.5 6.50 6.56 6.5 6.50 6.59 5.5	Pipe diameter	$B_p := 200 mm$	E.
Water Time (mins) Water Levels	Porosity	n := 100% no gravel used	역
	Water Levels (mbGL) 0 3.6 0.5 3.92 1 1 4.32 1.5 4.51 2 2 4.63 3 5.02 4 4 5.19 5 5.51 7 7 5.63 9 5.81 12 12 6.11 15 6.27 20 20 6.41 25 6.61 30 30 6.68 40 6.81 50 50 6.99		
			_

Test carried out by NI Date of test 06/12/23 R:\f6118GI Humber Doucy Lane, Ipswich, Suffolk, GJB\Calculations and File Notes\ Page 2 of 2 BHSA02 - Test 1.xmcd

Borehole Number BHSA03, Test	: 1, 8.00m	R
Borehole Diameter	B := 200mm	SA
Borehole Depth	D := 8.00m	ß
Depth from ground level to base of casing	$D_{c} := 7.50m$	
Depth from ground level to top of test interval	D _s := 0.00m	1EC
Completion depth of test	$D_e := 3.34m$	
Pipe diameter	$B_p := 200 mm$	R
Porosity	n := 100% no gravel used	더
$\begin{array}{c} Water \\ Levels \\ (mbGL) \end{array}$		

Test carried out by NI Date of test 06/02/24 R\16118GI Humber Doucy Lane, Ipswich, Suffolk, GJB\Calculations and File Notes\ Page 2 of 2 BHSA03 - Test 1.xmcd

Borehole Number BHSA04, Tes	t 1, 8.00m	2
Borehole Diameter	B := 200mm	SA
Borehole Depth	D := 8.00m	G
Depth from ground level to base of casing	$D_c := 7.50m$	
Depth from ground level to top of test interval	$\mathbf{D}_{\mathbf{S}} \coloneqq 0.00\mathbf{m}$	JOE1
Completion depth of test	$D_e := 0.24m$	
Pipe diameter	B _p := 200mm	R
Porosity	n := 100% no gravel used	匠
Ime (mins) Water Levels (mbGL) 0 0 0.5 0.03 1 0.04 1.5 0.05 2 0.06 3 0.07 4 0.08 5 0.08 7 0.09 9 0.1 15 0.13 20 0.14 25 0.16 30 0.19 40 0.21 50 0.22 60 0.24		
		-

Test carried out by NI Date of test 07/02/24 R\16118GI Humber Doucy Lane, Ipswich, Suffolk, GJB\Calculations and File Notes\ Page 2 of 2 BHSA04 - Test 1.xmcd

Borehole Number BHSA06, Test	t 1, 8.00m	R
Borehole Diameter	B := 200mm	SA
Borehole Depth	D := 8.00m	Ω
Depth from ground level to base of casing	$D_{c} := 7.50m$	
Depth from ground level to top of test interval	$D_{s} := 0.00m$	ي ال
Completion depth of test	$D_e := 0.28m$	
Pipe diameter	$B_p := 200 \text{mm}$	R R
Porosity	n := 100% no gravel used	역
Water Levels (mbGL) 0 0 0 0 0.5 0 1 0.01 1.5 0.01 2 0.02 3 0.03 4 0.03 5 0.04 7 0.04 9 0.06 12 0.07 15 0.09 20 0.12 25 0.15 30 0.17 40 0.21 50 0.24 60 0.28		

Test carried out by NI Date of test 09/02/24 R\16118GI Humber Doucy Lane, Ipswich, Suffolk, GJB\Calculations and File Notes\ Page 2 of 2 BHSA06 - Test 1.xmcd

Borehole Number BHSA07, Test	: 1, 8.00m	R
Borehole Diameter	B := 200mm	Ä
Borehole Depth	D := 8.00m	ß
Depth from ground level to base of casing	$D_{c} := 7.50m$	
Depth from ground level to top of test interval	$D_{s} := 0.00m$	Ē
Completion depth of test	$D_{e} := 0.32m$	
Pipe diameter	$B_p := 200 \text{mm}$	R.
Porosity	n := 100% no gravel used	E
Water Levels (mbGL) 0 0 0 0 0.5 0.06 1 0.06 2 0.08 4 0.13 5 0.15 9 0.18 15 0.2 20 0.25 40 0.27 50 0.3 60 0.32		
Test serviced sut by NU	,	

Test carried out by NI Date of test 27/11/23 R:\f6118GI Humber Doucy Lane, Ipswich, Suffolk, GJB\Calculations and File Notes\ Page 2 of 2 BHSA07 - Test 1.xmcd
Borehole Num	ber SA01, F	ield Test 1, 8.00m	RS
Borehole Diameter		B := 200 mm	Ď
Borehole Depth		D := 8.00 m	
Depth from ground level at start of the t	level to water est	$D_{s} := 6.62 \text{ m}$	
Pipe Inside Diamete	er	$P_i := 50 \text{ mm}$	
Pipe Outside Diame	eter	$P_0 := 63 \text{ mm}$	
Porosity of granular	backfill	n := 42 % (assumed)	
Time (mins)	Water Levels (mbGL)		
0	6.62		
0.5	6.77		
1	6.81		
1.5	6.92		
2	6.97		
3	7.12		
4	7.28		
5	7.5		
6	7.65		
/	7.07		
9	7.73		
10	7.78		
11	7.79		
12	7.81		
D			
Depths when bore	hole is 75% and	25% full	
$D_{75} = 6.965 \mathrm{m}$	D ₂₅ = 7	.655 m	

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA01, Field Test 2, 8.00m				
Borehole Diameter		B := 200 mm) G	
Borehole Depth		D := 8.00 m		
Depth from ground le level at start of the te	evel to water st	$D_{s} := 6.55 \text{ m}$	<u>の国</u> 山(
Pipe Inside Diameter	r	$P_i := 50 \text{ mm}$		
Pipe Outside Diamet	ter	$P_0 := 63 \text{ mm}$		
Porosity of granular b	backfill	n := 42 % (assumed)		
Time (mins) 0 0.5 1 1 1.5 2 3 4 4 5 6 7 8	Water Levels (mbGL) 6.55 6.7 6.9 7.06 7.33 7.52 7.69 7.79 7.82 7.83 7.83 7.83			
I.L.				
Depths when boreh	nole is 75% and 25%	full		
$D_{75} = 6.912 \mathrm{m}$	$D_{25} = 7.638 \mathrm{m}$	1		
<u> </u>				

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA01, Field Test 3, 8.00m				
Borehole Diameter		B := 200 mm	A	
Borehole Depth		D := 8.00 m		
Depth from ground I level at start of the te	evel to water est	D _s := 6.69 m) [[[[]	
Pipe Inside Diamete	er	$P_i := 50 \text{ mm}$		
Pipe Outside Diame	ter	P _o := 63 mm	19 19	
Porosity of granular	backfill	n := 42 % (assumed)		
Time (mins)	Water Levels (mbGL)			
	6 69			
0.5	6.72			
1	6.81			
1.5	6.94			
2	7.05			
3	7.41			
4	7.6			
5	7.72			
6	7.74			
7	7.78			
9	7.78			
R.				
Depths when bore	hole is 75% and 2	5% full		
$D_{75} = 7.018 \mathrm{m}$	$D_{25} = 7.6^{\circ}$	73 m		

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA02, Field Test 1, 8.00m **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m Depth from ground level to water $D_{s} := 6.62m$ level at start of the test Depth to natural groundwater $D_{W} := 7.86m$ Pipe Inside Diameter $P_i := 50mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)



D.

Depths when borehole is 75% and 25% full

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$$D_{75} = 6.93 \,\mathrm{m}$$

 $D_{25} = 7.55 \,\mathrm{m}$

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Test carried out by MR/PT Date of test 12/02/24

Borehole Number SA02, Field Te	est 2, 8.00m	RS
Borehole Diameter	B := 200mm	ÄG
Borehole Depth	D := 8.00m	
Depth from ground level to water level at start of the test	$D_{S} := 6.67m$	D TE
Depth to natural groundwater	D _w := 7.86m	ЮH
Pipe Inside Diameter	$P_i := 50 mm$	NIC
Pipe Outside Diameter	$P_0 := 63 \text{mm}$	ا گۇ
Porosity of granular backfill	n := 42% (assumed)	<u> </u>
Time (mins)Water Levels (mbGL) 0 6.67 0.5 6.68 1 6.68 1.5 6.75 2 6.77 3 6.88 4 7.02 5 7.07 6 7.09 7 7.14 8 7.17 9 7.19 10 7.22 11 7.24 12 7.27 13 7.29 14 7.31 20 7.4 25 7.47 30 7.51 35 7.55 40 7.6 45 7.62 50 7.66		
Depths when borehole is 75% and 25% fu D ₇₅ = 6.968 m D ₂₅ = 7.563 m	ll	

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA02, F	ïeld Test 3, 8.00m	J
Borehole Diameter Borehole Depth Depth from ground level to water	B := 200mm D := 8.00m D ₈ := 6.24m	
level at start of the test Depth to natural groundwater	D _w := 7.86m	1951
Pipe Inside Diameter	P _i := 50mm	
Pipe Outside Diameter	$P_0 := 63 \text{mm}$	RI) RI
Porosity of granular backfill	n := 42% (assumed)	
Time (mins)Water Levels (mbGL) 0 6.24 0.5 6.27 1 6.4 1.5 6.58 2 6.67 3 6.78 4 6.86 5 6.95 6 7.03 7 7.09 8 7.12 9 7.15 10 7.2 11 7.28 14 7.33 15 7.35 20 7.37 25 7.41 30 7.45 35 7.49 40 7.5 55 7.64 60 7.65 65 7.67	d 25% full 7.455 m	



Borehole Number SA03, Field Test 1, 8.00m **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m Depth from ground level to water $D_{s} := 6.21 m$ level at start of the test Depth to natural groundwater $D_{W} := 7.82m$ Pipe Inside Diameter $P_i := 50 mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)



3

4

7.52

7.67

R.

Depths when borehole is 75% and 25% full

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 $D_{75} = 6.612 \,\mathrm{m}$

 $D_{25} = 7.418 \,\mathrm{m}$

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA03, Field Test 2, 8.00m **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m $D_s := 6.29m$ Depth from ground level to water level at start of the test Depth to natural groundwater $D_{W} := 7.82m$ Pipe Inside Diameter $P_i := 50 mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)



3

4

5

6

7.34

7.53

7.61

7.7



Depths when borehole is 75% and 25% full

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$$D_{75} = 6.673 \,\mathrm{m}$$

 $D_{25} = 7.438 \,\mathrm{m}$

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



rsa ge¢technics litd

Borehole Number SA03, Field Test 3, 8.00m **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m Depth from ground level to water $D_s := 6.22m$ level at start of the test Depth to natural groundwater $D_{W} := 7.82m$ Pipe Inside Diameter $P_i := 50 mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)



0.5	6.35
1	6.49
1.5	6.71
2	6.8
3	7.05
4	7.21
5	7.47
6	7.53
7	7.59
8	7.69
9	7.73

<u>k</u>

Depths when borehole is 75% and 25% full

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 $D_{75} = 6.62 \,\mathrm{m}$

 $D_{25} = 7.42 \,\mathrm{m}$

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA04, Field To	est 1, 8.00m	RS
Borehole Diameter	B := 200mm	Þ
Borehole Depth	D := 8.00m	
Depth from ground level to water level at start of the test	D _s := 6.00m	₽ U E
Depth to natural groundwater	D _w := 7.45m	Î. Î.
Pipe Inside Diameter	$P_i := 50 mm$	
Pipe Outside Diameter	$P_0 := 63 \text{mm}$	en e
Porosity of granular backfill	n := 42% (assumed)	LT D
Time Water (mins) (mbGL)		



Depths when borehole is 75% and 25% full

Þ

$$D_{75} = 6.362 \,\mathrm{m}$$

 $D_{25} = 7.088 \,\mathrm{m}$

0

0.5

1 1.5

2

3

4

5

5.5

6.5

6

7

8

9

10

12

6 6

6.01

6.06

6.15

6.15

6.29

6.63

6.79

6.9

6.94

6.96

6.98

7.02

7.05

7.1

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA04, Field Test 2, 8.00m rsa ge¢technics litd **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m Depth from ground level to water $D_s := 5.80m$ level at start of the test Depth to natural groundwater $D_{W} := 7.45m$ Pipe Inside Diameter $P_i := 50 mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)

T (r	īme nins)	Wate Leve (mbG	er Is L)
	0	5.8	
	0.5	5.82	
	1	5.83	
	1.5	5.84	
	2	5.86	
	2.5	5.88	
	3	5.92	
	3.5	5.94	
	4	5.97	
	5	6.02	
	6	6.06	
	7	6.07	
	8	6.28	
	8.5	6.44	
	9	6.57	
	9.5	6.72	
	10	6.84	
	10.5	6.92	
	11	6.94	
	12	6.98	
	13	7.02	
	14	7.04	
	15	7.07	

Depths when borehole is 75% and 25% full

Þ

$$D_{75} = 6.213 \,\mathrm{m}$$

 $D_{25} = 7.037 \,\mathrm{m}$

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA04, Field Test 3, 8.00m rsa ge¢technics litd **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m Depth from ground level to water $D_s := 5.81m$ level at start of the test Depth to natural groundwater $D_{W} := 7.45m$ Pipe Inside Diameter $P_i := 50 mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)

T (r	īme nins)	Wate Leve (mbG	er Is iL)
	0	5.81	
	1	5.83	
	2	5.85	
	3	5.87	
	4	5.94	
	5	5.98	
	6	6.02	
	7	6.08	
	7.5	6.12	
	8	6.17	
	8.5	6.21	
	9	6.26	
	9.5	6.3	
	10	6.51	
	10.5	6.64	
	11	6.78	
	11.5	6.88	
	12	6.93	
	12.5	6.95	
	13	6.98	
	14	7.01	
	15	7.03	
	16	7.06	

D.

Depths when borehole is 75% and 25% full

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$$D_{75} = 6.22 \,\mathrm{m}$$

 $D_{25} = 7.04 \,\mathrm{m}$



Borehole Number SA06, Field Test 1, 8.00m					
Borehole Diameter		B := 200 mm	A		
Borehole Depth		D := 8.00 m			
Depth from ground I level at start of the te	evel to water est	D _s := 6.27 m) [[] []] []		
Pipe Inside Diamete	er	P _i := 50 mm			
Pipe Outside Diame	eter	P _o := 63 mm	1 Q		
Porosity of granular	backfill	n := 42 % (assumed)			
Time (mins)	Water Levels (mbGL)				
0	6 27				
0.5	6.41				
1	6.78				
1.5	6.93				
2	7.11				
3	7.23				
4	7.31				
5	7.39				
6	7.46				
7	7.51				
8	7.59				
9	7.66				

Depths when bore	Depths when borehole is 75% and 25% full				
$D_{75} = 6.702 \mathrm{m}$	$D_{25} = 7.5$	67 m			

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



		er SAUG, FI	eld Test 2, 8.00m	R
Borehole D	Diameter		B := 200 mm	ŠĂ (
Borehole Depth			D := 8.00 m	
Depth from	around le	vel to water	D = 6.24 m	р Г
level at sta	rt of the tes	st	D _S = 0.24 m	ы П
Pipe Inside	Diameter		$P_i := 50 \text{ mm}$	
Pipe Outsid	de Diamete	er	$P_0 := 63 \text{ mm}$	
Porosity of	granular b	ackfill	n := 42 % (assumed)	
	Time mins)	Water Levels (mbGL)		e
	0	6.24		
	0.5	6.39		
	1	6.55		
	1.5	6.73		
	2	6.86		
	3	7.01		
	4	7.2		
	5	7.31		
	7	7.35		
	8	7.49		
	9	7.58		
	10	7.61		
	11	7.68		
b				
Depths w	hen boreh	ole is 75% and	25% full	
$D_{75} = 6.6$	58 m	D ₂₅ = 7.	56 m	

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA06, Field Test 3, 8.00m					
Borehole Diameter			B := 200 mm	Ä	
Boreho	le Depth		D := 8.00 m		
Depth f	rom ground le	evel to water	D _s := 6.30 m) TE	
Pipe In:	side Diameter		$P_i := 50 \text{ mm}$	の 日	
Pipe O	utside Diamet	er	$P_{0} := 63 \text{ mm}$		
Porosit	y of granular k	packfill	n := 42 % (assumed)	З С	
				UD	
	Time (mins)	Water Levels (mbGL)			
		63			
	0.5	6.41			
	1	6.53			
	1.5	6.68			
	2	6.79			
	3	6.92			
	4	7.04			
	5	7.19			
	6	7.25			
	7	7.36			
	8	7.49			
	9	7.53			
	10	7.56			
	11	7.57			
	12	7.59			
	13	7.62			
	15	7.63			
	16	7.66			
Depth	Depths when borehole is 75% and 25% full				
D ₇₅ =	= 6.725 m	D ₂₅ = 7.5	75 m		

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA07, Field Test 1, 8.00m **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m Depth from ground level to water $D_{s} := 6.79m$ level at start of the test Depth to natural groundwater $D_{W} := 7.85m$ Pipe Inside Diameter $P_i := 50 mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)



Depths when borehole is 75% and 25% full

Þ

$$D_{75} = 7.055 \,\mathrm{m}$$

 $D_{25} = 7.585 \,\mathrm{m}$

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA07, Field Test 2, 8.00m **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m Depth from ground level to water $D_{s} := 6.68m$ level at start of the test Depth to natural groundwater $D_{W} := 7.85m$ Pipe Inside Diameter $P_i := 50 mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)



Depths when borehole is 75% and 25% full

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$$D_{75} = 6.973 \,\mathrm{m}$$

$$D_{25} = 7.557 \,\mathrm{m}$$

Date: 26/02/2024 Calcs:JMK. Checked:GJB.



Borehole Number SA07, Field Test 3, 8.00m **Borehole Diameter** B := 200mm **Borehole Depth** D := 8.00m Depth from ground level to water $D_s := 6.48m$ level at start of the test Depth to natural groundwater $D_{W} := 7.85m$ Pipe Inside Diameter $P_i := 50 mm$ Pipe Outside Diameter $P_0 := 63 \text{mm}$ Porosity of granular backfill n := 42% (assumed)



Depths when borehole is 75% and 25% full

►

$$D_{75} = 6.822 \,\mathrm{m}$$

 $D_{25} = 7.508 \,\mathrm{m}$

Date: 26/02/2024 Calcs:JMK. Checked:GJB.




APPENDIX G FEH GREENFIELD CALCULATIONS

Barratt David Wilson Homes & Hopkins Homes Humber Doucy Lane Flood Risk Assessment & Drainage Strategy 681058-R1(0)-FRA



Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Benjamin Donoghue			Site Details						
Site name:	Humbe	r Doucy Lane			Latitude:	52.07533° N				
Site location:	Develo	pment Area			Longitude:	1.18930° E				
This is an estimation best practice criteri management for dev 2015) and the non-s greenfield runoff rat surface water runof	n of the gre ia in line with velopments tatutory sta tes may be f from sites	enfield runoff rat th Environment Ag s", SC030219 (2013 andards for SuDS the basis for set s.	es that a gency gu) , the Su (Defra, 2 ting cons	are used to mo idance "Rainfa uDS Manual C7 2015). This info sents for the o	o meet normal infall runoff Reference: 1948170288 I C753 (Ciria, nformation on he drainage of Date: Feb 26 2024 11:58					
Runoff estimation FEH St approach				Statistical						
Site charac	terist	ics			Notes					
Total site area (h	a): ^{18.80}	6			(1) Is Q _{BAR} < 2.0	l/s/ha?				
Methodolog	gy									
Q _{MED} estimation method: Calculate from BF				and SAAR	When Q_{BAR} is < 2.0 l/s/ha then limiting discharged					
BFI and SPR method: Specify BFI ma			nanuall	у	rates are set at 2.0 l/s/ha.					
HOST class: 19										
BFI / BFIHOST: 0.837					(2) Are flow rates < 5.0 l/s?					
Q _{MED} (I/s):		57.4			are less than 5.0 l/s consent					
Q _{BAR} / Q _{MED} factor	r.	1.12			from vegetation and other materials is possib					
Hydrological characteristics _{Defau} SAAR (mm): ⁵⁷⁸			t Į	Edited	Lower consent flow rates may be set where blockage risk is addressed by using appropr drainage elements.					
Hydrological region: 5				5	(3) Is SPR/SPRH	lOST ≤ 0.3?				
Growth curve factor 1 year: 0.87			(0.87						
Growth curve factor 30 2.45 years:				2.45	Where groundwat use of soakaways	er levels are low enough the to avoid discharge offsite				
Growth curve factor 100 3.56 years:				3.56	would normally be preferred for disposa surface water runoff.					

4.21

4.21

Growth curve factor 200

years:

Greenfield runoff rates	Default	Edited
Q _{BAR} (I/s):	64.52	8.83
1 in 1 year (l/s):	56.13	7.68
1 in 30 years (I/s):	158.08	21.64
1 in 100 year (l/s):	229.7	31.45
1 in 200 years (l/s):	271.64	37.19

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.



Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	d by: Benjamin Donoghue			Site Details						
Site name:	Humbe	er Doucy Lane			Latitude:	52.07533° N				
Site location:	Develo	oment Area			Longitude: 1.18930° E					
This is an estimation best practice criteri management for dev 2015) and the non-st greenfield runoff rat surface water runoff	of the gre a in line wit velopments atutory sta tes may be f from sites	enfield runoff rate th Environment Ag s", SC030219 (2013) andards for SuDS (the basis for sett 3.	es that are gency guida) , the SuDS (Defra, 2015 ing consen	used to ma nce "Rainfa Manual C7). This info ts for the o	eet normal all runoff Reference: 53 (Ciria, rmation on drainage of Date:	482407366 Feb 26 2024 11:59				
Runoff estii approach	matio	n	FEH Sta	tistical						
Site charac	terist	ics			Notes					
Total site area (h	a): ^{31.28}	5			(1) IS $O_{BAD} < 2.0$	l/s/ha?				
Methodolog	gy			4		., ., .,				
Q _{MED} estimation r	nethod:	Calculate fro	om BFI and	SAAR	When Q_{BAR} is < 2.0 l/s/ha then limiting discharge					
BFI and SPR meth	BFI and SPR method: Specify BFI				rates are set at 2.0 l/s/ha.					
HOST class:										
BFI / BFIHOST:	BFI / BFIHOST: 0.837				(2) Are flow rates < 5.0 l/s?					
Q _{MED} (I/s):	9	95.12			Where flow rates are less than 5.0 l/s consent					
Q _{BAR} / Q _{MED} factor	:	1.12			from vegetation and other materials is possible					
Hydrologica characteris	al stics	Default	: Ec	dited	Lower consent fle	ow rates may be set where the ddressed by using appropriate				
SAAR (mm):		578	578		drainage eiemen	ΓS.				
Hydrological regi	on:	5	5		(3) Is SPB/SPBHOST ≤ 0.3?					
Growth curve fac	tor 1 yea	r. 0.87	0.87	7						
Growth curve factor 30 2.45			2.45	5	Where groundwa	ter levels are low enough the to avoid discharge offsite				
Growth curve fac years:	tor 100	3.56	3.56	6	would normally be preferred for dispos					
Growth curve factor 200 A 21										

4.21

years:

4.21

Greenfield runoff rates	Default	Edited
Q _{BAR} (I/s):	106.91	14.64
1 in 1 year (l/s):	93.01	12.73
1 in 30 years (I/s):	261.93	35.86
1 in 100 year (l/s):	380.6	52.1
1 in 200 years (l/s):	450.1	61.62

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APPENDIX H SURFACE WATER DRAINAGE CALCULATIONS

Barratt David Wilson Homes & Hopkins Homes Humber Doucy Lane Flood Risk Assessment & Drainage Strategy 681058-R1(0)-FRA

CAUSEWAY (*) RSK Land & Development Network: Storm LDE Coventry1 29/02/2024	t 1.pfd Page 1 Network
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<u>Design Settings</u>

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	1.000
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	\checkmark
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	\checkmark
Maximum Rainfall (mm/hr)	999.9		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.200	5.00	50.950	1350	618539.063	246782.422	1.650
2	0.247	5.00	50.900	1350	618518.387	246755.127	1.684
3	0.158	5.00	50.450	1350	618569.550	246716.044	1.650
4	0.188	5.00	51.000	1350	618460.807	246750.959	1.575
5	0.188	5.00	50,700	1350	618505.949	246713.629	1.650
6	0.186	5.00	50.250	1350	618582.664	246660.387	1.575
7			50.450	1500	618558.149	246701.821	2.224
8	0.188	5.00	50.800	1350	618436.005	246721.848	1.575
9	0.188	5.00	50.500	1350	618483.024	246678.568	1.575
10	0.186	5.00	49.950	1350	618556.699	246631.899	1.500
11			49.600	1800	618503.640	246631.194	1.950
12	0.186	5.00	49.900	1350	618612.400	246641.621	1.575
13	0.186	5.00	49.550	1350	618595.631	246608.895	1.575
14			48.900	1800	618574.097	246573.041	2.100
15	0.186	5.00	49.300	1350	618639.714	246595.637	1.575
16			48.500	1950	618649.497	246524.079	2.009
17	0.250	5.00	51.000	1350	618739.932	246832.754	1.650
18	0.250	5.00	50.700	1350	618793.536	246801.003	1.650
19	0.250	5.00	50.450	1500	618830.650	246778.255	1.800
20			50.350	1500	618869.991	246758.643	1.800
21			50.000	1500	618831.526	246685.316	1.800
22	0.250	5.00	50.300	1350	618798.644	246760.992	1.650
23	0.250	5.00	50.150	1350	618794.015	246699.217	1.766
24			49.800	1500	618788.010	246667.320	1.800
25	0.096	5.00	51.000	1200	618660.509	246832.497	1.500
26	0.093	5.00	50.850	1350	618697.839	246800.194	1.627
27	0.094	5.00	50.600	1350	618734.690	246772.921	1.575
28	0.080	5.00	50.300	1350	618737.621	246732.670	1.575
29	0.130	5.00	50.800	1350	618678.422	246774.150	1.575
30	0.140	5.00	50.450	1200	618628.747	246706.291	1.500
31			50.600	1350	618654.166	246739.633	1.897
32	0.140	5.00	50.050	1200	618662.975	246679.569	1.500
33	0.130	5.00	50.550	1350	618714.951	246745.261	1.425
34			50.200	1350	618691.906	246710.960	1.900
35	0.131	5.00	49.950	1200	618652.321	246654.149	1.500
36	0.088	5.00	49.700	1200	618693.961	246666.488	1.500
37			50.000	1800	618714.519	246695.298	2.900
38			49.900	1800	618726.696	246683.669	2.822
39	0.133	5.00	49.700	1350	618724.000	246653.953	1.500
40			49.750	1950	618771.141	246641.226	3.052
41	0.064	5.00	49.550	1200	618672.800	246619.498	1.425
42	0.133	5.00	49.700	1200	618704.648	246631.718	1.851
43	0.133	5.00	49.300	1200	618700.926	246591.525	1.500
44			49.100	1200	618724.898	246567.767	1.500
45			49.400	1950	618736.532	246591.475	2.763
46	0.142	5.00	48.300	1200	618701.298	246529.237	1.011
47			47.874		618744.454	246559.316	1.400
47 OUT			48.000	1800	618762.082	246544.375	3.500

<u>Links (Input)</u>

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
12.000	1	2	34.242	0.600	49.300	49.216	0.084	407.6	450	5.57	119.5
12.001	2	3	64.383	0.600	49.216	48.800	0.416	154.8	450	6.23	114.2
12.002	3	7	18.228	0.600	48.800	48.451	0.349	52.2	450	6.34	113.4
13.000	4	5	58.578	0.600	49.425	49.050	0.375	156.2	450	5.60	119.3
13.001	5	7	53.519	0.600	49.050	48.451	0.599	89.3	450	6.02	115.8
14.000	6	7	48.143	0.600	48.675	48.526	0.149	323.1	375	5.80	117.6